

CLAIMS

1. A DNA coding for a polypeptide of the following (A) or (B):

(A) a polypeptide which comprises the amino acid
5 sequence of SEQ ID NO: 48; or

(B) a polypeptide which comprises an amino acid sequence including deletion, substitution or insertion of one or several amino acids in the amino acid sequence as defined in (A), and which has an activity to support
10 proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells.

2. The DNA according to claim 1, which is a DNA of the following (a) or (b):

(a) a DNA which comprises the nucleotide sequence
15 of nucleotides 18 to 746 of SEQ ID NO: 47; or

(b) a DNA which is hybridizable with a DNA comprising the nucleotide sequence as defined in (a) or a probe prepared from said DNA, under the stringent condition, and which has an activity to support proliferation or
20 survival of hematopoietic stem cells or hematopoietic progenitor cells.

3. The DNA according to claim 2, the stringent condition is 6 x SSC, 5 x Denhardt, 0.5% SDS and 68°C (SSC: 3 M NaCl, 0.3 M sodium citrate; 50 x Denhardt: 1%
25 BSA, 1% polyvinyl pyrrolidone, 1% Ficoll 400), or 6 x SSC, 5 x Denhardt, 0.5% SDS, 50% formamide and 42°C.

4. A expression vector which comprises the DNA

of any one of claims 1 to 3 in such a manner that the DNA can be expressed.

5. A cell into which the DNA of any one of claims 1 to 3 is introduced in such a manner that the DNA can be expressed.

6. A polypeptide which is an expression product of the DNA of any one of claims 1 to 3, the polypeptide having an activity to support proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells.

7. The polypeptide according to claim 6, which comprises the amino acid sequence of SEQ ID NO: 48, or an amino acid sequence including deletion, substitution or insertion of one or several amino acids in the amino acid sequence.

8. The polypeptide according to claim 6 or 7, which is modified with one or more modifying agents selected from the group consisting of polyethylene glycol (PEG), dextran, poly(N-vinyl-pyrrolidone), polypropylene glycol homopolymer, copolymer of polypropylene oxide/ethylene oxide, polyoxyethylated polyol and polyvinyl alcohol.

9. An monoclonal antibody which binds to the polypeptide of any one of claims 6 to 8.

10. A method for supporting proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells, comprising the step of co-culturing

stromal cells in which a DNA coding for a polypeptide of the following (A) or (B) is expressed, with hematopoietic stem cells or progenitor cells,

(A) a polypeptide which comprises the amino acid
5 sequence of SEQ ID NO: 48; or

(B) a polypeptide which comprises an amino acid sequence including deletion, substitution or insertion of one or several amino acids in the amino acid sequence as defined in (A), and which has an activity to support
10 proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells.

11. The method according to claim 10, wherein the DNA is a DNA of the following (a) or (b):

(a) a DNA which comprises the nucleotide sequence
15 of nucleotides 18 to 746 of SEQ ID NO: 47; or

(b) a DNA which is hybridizable with a DNA comprising the nucleotide sequence as defined in (a) or a probe prepared from said DNA, under the stringent condition, and which has an activity to support proliferation or
20 survival of hematopoietic stem cells or hematopoietic progenitor cells.

12. A method for supporting proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells, comprising the step of culturing
25 hematopoietic stem cells or progenitor cells in the presence of a polypeptide of the following (A) or (B), said polypeptide having an activity to support

proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells when the hematopoietic stem cells or hematopoietic progenitor cells are cultured in the presence of the polypeptide,

5 (A) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 48; or

 (B) a polypeptide which comprises an amino acid sequence including deletion, substitution or insertion of one or several amino acids in the amino acid sequence
10 as defined in (A), and which has an activity to support proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells.

13. A pharmaceutical composition having an effect to support proliferation or survival of
15 hematopoietic stem cells or hematopoietic progenitor cells, which comprises an effective amount of a polypeptide of the following (A) or (B), said polypeptide having an activity to support proliferation or survival of hematopoietic stem cells or hematopoietic
20 progenitor cells when hematopoietic stem cells or hematopoietic progenitor cells are cultured in the presence of the polypeptide,

 (A) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 48; or

25 (B) a polypeptide which comprises an amino acid sequence including deletion, substitution or insertion of one or several amino acids in the amino acid sequence

as defined in (A), and which has an activity to support proliferation or survival of hematopoietic stem cells or hematopoietic progenitor cells.